REMARKS

Claims 1-43, 46-67 and 69-74 are pending in the above-captioned patent application after this amendment. Claims 1-72 are rejected. Claims 44 and 45 have been objected to.

The Applicants respectfully disagree with the rejection of claims 1-72. However, the Applicants have amended claims 1, 23-37 and 59, canceled claims 44, 45 and 68 without prejudice, and added new claims 73 and 74 with this amendment for the purpose of expediting the patent application process in a manner consistent with the goals of the Patent Office (65 Fed. Reg. 54603), and/or to clarify what the Applicants regard as the present invention. Additionally, the Applicants have amended claim 41 to further clarify the language of the claim and what the Applicants regard as the present invention and not to substantively alter the breadth of the claim in response to any stated rejections. Further, the Applicants have amended claims 61 and 62 to correct certain informalities and not to overcome any stated rejections. Still further, the specification has been amended with this amendment to further clarify what the Applicants regard as the present invention and/or to correct certain typographical errors.

Support for the amendments to the claims can be found throughout the originally filed specification. In particular, support for the amendments to claims can be found in the specification at least at page 9, line 30 through page 10, line 5, at page 11, line 19 through page 12, line 16, at page 16, line 34 through page 17, line 17, in Figures 2A, 2B, and 4A-4C, and in the originally filed claims.

Support for new claims 73 and 74 can be found throughout the originally filed specification. In particular, support for new claims 73 and 74 can be found in the originally filed claims.

New claim 73 is based on original claim 44 rewritten in independent form. Therefore, because new claim 73 contains only those limitations contained in original claim 44, new claim 73 is not narrower in scope than originally filed claim 44. Original claim 44 was found to contain patentable subject matter. Accordingly, new claim 73 is considered to be in condition for allowance.

No new matter is believed to have been added by this amendment.

Reconsideration of the pending application is respectfully requested in view of the

above-recited amendments and the arguments set forth below.

Interview Summary

On November 13, 2007, the undersigned attorney for the Applicants conducted a telephonic interview with the Examiner, Andrew P. Smyth, to discuss the rejections to the claims. Prior to the interview, a draft response was forwarded to the Examiner. No final agreement on specific claim language was reached during the interview, however, potential amendments to independent claims 1, 23, and 41 were discussed. The Examiner preliminarily agreed to language in claims 1 and 41 that would overcome the present rejections. The Applicants want to thank the Examiner for his time and efforts.

Allowable Material

Claims 44 and 45 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As stated above, new claim 73 is based on original claim 44 rewritten in independent form. Original claim 44 was found to contain patentable subject matter. Accordingly, new claim 73 is considered to be patentable. Because new claim 74 depends directly from new claim 73, it is also considered to be patentable. Moreover, new claim 74 is based on original claim 45, which was also found to contain patentable subject matter.

Rejections Under 35 U.S.C. §102(b)

Claims 1-16, 41-43 and 47-52

Claims 1-16, 41-43 and 47-52 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,389,939 issued to Skoyles ("Skoyles"). The Applicants respectfully submit that the rejection of claim 1, as amended, is unsupported by the art and should be withdrawn. Additionally, as noted above, the Applicants have amended claim 41 to further clarify the language of the claim and what the Applicants regard as the present invention and not to substantively alter the breadth of the claim in response to the

stated rejection. Accordingly, the Applicants respectfully traverse the rejection of claims 41-43 and 47-52 and the Applicants respectfully submit that the rejection of claims 41-43 and 47-52 is unsupported by the art and should be withdrawn.

In particular, the Patent Office contends that Skoyles discloses "a force provider comprising: a provider housing that defines a piston chamber (15), the provider housing including a first beam aperture (31 into 15), a first cylinder aperture (bottom cylinder aperture) that is in fluid communication with a fluid at a first pressure and a spaced apart second cylinder aperture (upper aperture) that is in fluid communication with a fluid that is approximately at the first pressure; and a piston assembly including a piston (30) positioned in a piston chamber, and a first beam (31) extending through the first beam aperture, the piston including a first piston side and a second piston side, the first beam being secured to the first piston side, the piston moving relative to the provider housing along a piston path, wherein at a first piston region of the piston path, the piston is positioned between the first beam aperture and the first cylinder aperture and at a second piston region of the piston path, the piston is positioned between the cylinder apertures."

Further, the Patent Office contends that Skoyles discloses "a force provider comprising: a provider housing that defines a piston chamber (41, 15); and a piston assembly including a piston (39) and a first intermediate piston (30) positioned within the piston chamber, the piston moving relative to the provider housing along a piston path that includes a first piston region and a second piston region, wherein the first intermediate piston moves concurrently (31) with the piston when the piston is positioned in at least a portion of the first piston region and wherein the piston moves relative (31) to the first intermediate piston when the piston is positioned in the second piston region."

Still further, the Patent Office contends that Skoyles discloses additional features as claimed in the present application.

The Applicants provide that Skoyles is directed to different embodiments of an anti-lock apparatus for a vehicle braking system having a control piston 30 interposed in an open fluid passage between a master cylinder and a brake cylinder 23. Each relevant embodiment of the anti-lock apparatus typically includes a hydraulic pressure fluid line 10 emanating from the master cylinder that transmits pressurized fluid to the brake cylinder

23, and the control piston 30 that is inserted in the pressure line and that is actuated by an electromagnet or the like, which engages a control rod 31 that extends through an aperture in the piston chamber and is connected to the piston 30. The anti-lock apparatus may also include a balancing piston 35 that is subject to pressure from the master cylinder and provides a constant force, and a force-balancing device such as a cam 36 that is connected to the control rod 31, which ensures that the horizontal force Fh necessary for anti-lock control is provided by the horizontal component of the force from the balancing piston 35. The control piston 30 becomes effective when the control rod 31 has moved the control piston 30 up to the restricted bore provided by a shoulder 15. As the piston 30 is moved to the left under the influence of force Fh there comes a point when it contacts the shoulder 15 and at that point it starts to reduce brake pressure.

As shown in Figure 5, the anti-lock apparatus may also include a rod secured to the other side of the control piston 30 and extends through an aperture at the other end of the piston chamber before being connected to an energy store spring 38. Further, as shown in Figure 6, the anti-lock apparatus may also include a second piston 39 in ganged relation to the control piston 30 and adapted to displace all of the fluid so that none is fed back to the master cylinder. (Skoyles Abstract, column 3, lines 60-69, column 4, lines 35-63, column 5, lines 14-17, column 6, lines 21-50, column 7, lines 34-51, and in Figures 1, 4, 5 and 6).

However, relating to claim 1, Skoyles does not disclose a force provider including: a provider housing having a first beam aperture, a first cylinder aperture and a second cylinder aperture; and a piston having a first piston side and a second piston side, the piston moving relative to the provider housing along a piston path, wherein the piston is positioned between the first beam aperture and the first cylinder aperture and the second piston side is closer than the first piston side to the first cylinder aperture and the second cylinder aperture when the piston is at a first piston region of the piston path, and wherein the piston is positioned between the cylinder apertures when the piston is at a second piston region of the piston path.

In each embodiment of Skoyles, the fluid line extending between the piston chamber and the brake cylinder 23 is adjacent to and forms a part of the end wall of the piston chamber through which the beam aperture extends. The fluid line 10 extending

between the piston chamber and the master cylinder may be adjacent to and form a part of the opposite end wall of the piston chamber (as shown in Figures 1 and 4) or it may be positioned intermediately along the side wall of the piston chamber (as shown in Figures 5 and 6). An additional fluid line may also be included between the piston chamber and the balancing piston 35 adjacent to and forming a part of the opposite end wall of the piston chamber (as shown in Figure 6). However, in none of the embodiments do the pistons 30, 39 in the piston chamber ever move from one side of one of the fluid lines to the other side of that fluid line as it moves along the piston path, as would be required to meet the limitations of claim 1 as recited herein. To manage the respective fluid pressures as designed in the anti-lock mechanism in Skoyles, the pistons 30, 39 are always positioned between the same fluid lines (i.e. cylinder apertures).

Additionally, relating to claim 41, in the interview on November 13, 2007, the Examiner contended that the term "relative" is indefinite as used in this claim and that the pistons 30, 39 that are fixed together in Skoyles move relative to each other. The Applicants strongly disagree that the term "relative" is indefinite and disagree that the pistons 30, 39 that are fixed together in Skoyles move relative to each other. However, in order to avoid an argument regarding the meaning of the term "relative", the Applicants have instead chosen to amend claim 41 to remove the term "relative" so that claim 41 now recites that "the first intermediate piston moves concurrently with the piston when the piston is positioned in at least a portion of the first piston region and wherein the piston moves independently of the first intermediate piston when the piston is positioned in the second piston region so as to change the distance between the piston and the first intermediate piston." The Applicants respectfully submit that they have amended claim 41 simply to further clarify the language of the claim and what the Applicants regard as the present invention and not to alter the breadth of the claim in response to the stated rejection.

The Applicants respectfully assert that Skoyles does not disclose a force provider including: a provider housing; and a piston assembly including a piston and a first intermediate piston, wherein the first intermediate piston moves concurrently with the piston along a piston path when the piston is positioned in at least a portion of a first

piston region of the piston path and wherein the piston moves independently of the first intermediate piston when the piston is positioned in a second piston region of the piston path so as to change the distance between the piston and the first intermediate piston. In Figure 6, Skoyles illustrates a control piston 30 and a second piston 39 within the piston chamber, which could theoretically function as the piston and the first intermediate piston. However, while the control piston 30 and the second piston 39 can be shown to move concurrently when in a first piston region, at no point does Skoyles teach having the control piston 30 and the second piston 39 move independent of each other anywhere along the piston path so as to change the distance between the control piston 30 and the second piston 39.

In distinction to Skoyles, amended claim 1 of the present application requires "(a) force provider comprising: a provider housing that defines a piston chamber, the provider housing including a first beam aperture, a first cylinder aperture that is in fluid communication with a fluid at a first pressure and a spaced apart second cylinder aperture that is in fluid communication with a fluid that is approximately at the first pressure; and a piston assembly including a piston positioned in the piston chamber, and a first beam extending through the first beam aperture, the piston including a first piston side and a second piston side, the first beam being secured to the first piston side, the piston moving relative to the provider housing along a piston path, wherein at a first piston region of the piston path, the piston is positioned between the first beam aperture and the first cylinder aperture and the second piston side is closer than the first piston side to the first cylinder aperture and the second cylinder aperture, and wherein at a second piston region of the piston path, the piston is positioned between the cylinder apertures."

Because Skoyles does not disclose all of the elements of amended claim 1, the § 102(b) rejection is unsupported by the art and should be withdrawn. Because claims 2-16 depend either directly or indirectly upon amended claim 1, the § 102(b) rejection of claims 2-16 is also unsupported by the art and should be withdrawn.

Further, in distinction to Skoyles, claim 41 of the present application requires "(a) force provider comprising: a provider housing that defines a piston chamber; and a piston assembly including a piston and a first intermediate piston positioned within the

piston chamber, the piston moving relative to the provider housing along a piston path that includes a first piston region and a second piston region, wherein the first intermediate piston moves concurrently with the piston when the piston is positioned in at least a portion of the first piston region and wherein the piston moves independently of the first intermediate piston when the piston is positioned in the second piston region so as to change the distance between the piston and the first intermediate piston."

Because Skoyles does not disclose all of the elements of claim 41, the § 102(b) rejection is unsupported by the art and should be withdrawn. Because claims 42, 43 and 47-52 depend directly upon claim 41, the § 102(b) rejection of claims 42, 43 and 47-52 is also unsupported by the art and should be withdrawn.

Claims 23, 24, 37-40, 59, 60, 68, 71 and 72

Claims 23, 24, 37-40, 59, 60, 68, 71 and 72 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,987,558 issued to Yuan et al. ("Yuan et al."). The Applicants respectfully submit that the rejection of claims 23 and 59, as amended, is unsupported by the art and should be withdrawn.

In particular, the Patent Office contends that Yuan et al. discloses "a force provider assembly (column 5, lines 18-20) for use with a mover (column 5, lines 24-33) for moving a stage (201) along a stage path that includes a first stage region and a second stage region, the force provider assembly comprising: a pneumatic (column 5, lines 14-17) force provider coupled to the stage, the force provider providing an acceleration/deceleration force on the stage when the stage is in the first stage region and approximately no force on the stage when the stage is in the second stage region (column 5, lines 20-24)."

Further, the Patent Office contends that Yuan et al. discloses "a method for accelerating and decelerating a stage (abstract) that is moved along a stage path that includes a first stage region and a second stage region, the method comprising the step of: coupling a pneumatic force provider (column 5, lines 13-17) to the stage (201), the force provider providing an acceleration/deceleration force on the stage when the stage is in the first stage region and approximately no force on the stage when the stage is in the second stage region (column 4, lines 38-48)."

Still further, the Patent Office contends that Yuan et al. discloses additional features as claimed in the present application.

The Applicants provide that Yuan et al. is directed to, in relevant part, an exposure apparatus 21 used to manufacture semiconductor wafers 68, the exposure apparatus including a reticle stage 76, a wafer stage 66, a projection lens assembly 78, an illumination system 74, and an apparatus frame 72 to support the components of the exposure apparatus 21. A stage assembly 200 includes: a stage 201 (which could represent the reticle stage 76 or the wafer stage 66); a base 202 that supports the stage 201 via a first set of bearings 204, wherein the first set of bearings 204 allow the stage 201 to move linearly along the x and y axes and rotationally around the z axis; a second set of bearings 240 that supports the base 202 relative to a stationary surface or the ground 82, wherein the second set of bearings 240 allow the base 202 to move relative to the ground 82 in any directions necessary to reduce reaction forces on the ground 82; and a stage force F_{in} produced by a force generator such as a motor 10 to accelerate the stage 201. Each set of bearings 204, 240 could be a pneumatic system, such as air bearings, or magnetic levitation, mechanical support, or any equivalent support system, to allow the stage 201 to move relative to the base 202 and to allow the base 202 to move relative to the ground 82. The motor 10 could be a planar motor, a linear motor, or any type of commercially available force generator to the move the stage 201. (Yuan et al. column 4, line 35 through column 5, line 55, and in Figures 1 and 4).

However, Yuan et al. does not disclose a combination comprising: a mover that moves a stage along a stage path; and a pneumatic force provider coupled to the stage that provides an acceleration/deceleration force on the stage along the stage path when the stage is in the first stage region and approximately no force on the stage when the stage is in the second stage region. In the present application, the mover provides a force to help move the stage along the stage path and the pneumatic force provider provides an acceleration/deceleration force on the stage along the same stage path. Further, the pneumatic force provider provides an acceleration force on the stage when the stage is moving in one direction in the first stage region, and the pneumatic force provider provides a deceleration force on the stage when the stage is moving in the opposite direction in the first stage region.

Yuan et al. teaches the use of a stage force F_{in} produced by a motor 10 to accelerate the stage 201. However, the only teaching of the use of a pneumatic system is for a first set of bearings 204 that supports the stage 201 relative to the base 202 and allows the stage 201 to move relative to the base 202, and for a second set of bearings 240 that supports the base 202 relative to the ground 82 and allows the base 202 to move relative to the ground 82. Yuan et al. does not teach having either set of bearings 204, 240 provide an acceleration force and/or a deceleration force on the stage 201 along the stage path. While the first set of bearings 204 allows the stage 201 to move relative to the base 202, that is accomplished by providing an upward force to maintain the stage 201 spaced apart from the base 202, and it does not entail providing a force on the stage along the stage path. Further, Yuan et al. does not teach using the motor 10 to provide a deceleration force on the stage 201 at any time. Still further, Yuan et al. does not teach having the motor 10 utilize a pneumatic force.

In distinction to Yuan et al., amended claim 23 of the present application requires "(a) combination comprising: a mover that moves a stage along a stage path that includes a first stage region and a second stage region; and a force provider assembly including a pneumatic force provider coupled to the stage, the force provider providing an acceleration/deceleration force on the stage along the stage path when the stage is in the first stage region and approximately no force on the stage when the stage is in the second stage region."

Because Yuan et al. does not disclose all of the elements of amended claim 23, the § 102(b) rejection is unsupported by the art and should be withdrawn. Because claims 24 and 37-40 depend either directly or indirectly upon amended claim 23, the § 102(b) rejection of claims 24 and 37-40 is also unsupported by the art and should be withdrawn.

Further, in distinction to Yuan et al., amended claim 59 of the present application requires "(a) method for accelerating and decelerating a stage ... comprising the steps of: coupling a mover to the stage that moves the stage along a stage path that includes a first stage region and a second stage region; and coupling a pneumatic force provider to the stage, the force provider providing an acceleration/deceleration force on the stage along the stage path when the stage is in the first stage region and approximately no force on the stage when the stage is in the second stage region."

Because Yuan et al. does not disclose all of the elements of amended claim 59, the § 102(b) rejection is unsupported by the art and should be withdrawn. Because claims 60, 71 and 72 depend directly upon amended claim 59, the § 102(b) rejection of claims 60, 71 and 72 is also unsupported by the art and should be withdrawn.

Rejections Under 35 U.S.C. §103(a)

Claims 17-22, 25-36, 53-58, 61-67, 69 and 70

Claims 17-22, 25-36, 53-58, 61-67, 69 and 70 are rejected under 35 U.S.C. §103(a) as being unpatentable over Skoyles in light of Yuan et al.. The Applicants respectfully submit that the rejection of claims 17-22, 25-36, 53-58, 61-67, 69 and 70 is unsupported by the art and should be withdrawn.

As noted above, the rejection of amended claim 1 is unsupported by the art. Therefore, amended claim 1 negates a prima facie showing of obviousness with respect to the cited combination of references. Accordingly, claims 17-22, which directly or indirectly depend from amended claim 1, are patentably distinguishable over the cited combination of references.

Additionally, as noted above, the rejection of amended claim 23 is unsupported by the art. Therefore, amended claim 23 negates a prima facie showing of obviousness with respect to the cited combination of references. Accordingly, claims 25-36, which directly or indirectly depend from amended claim 23, are patentably distinguishable over the cited combination of references.

Further, as noted above, the rejection of claim 41 is unsupported by the art. Therefore, claim 41 negates a prima facie showing of obviousness with respect to the cited combination of references. Accordingly, claims 53-58, which directly or indirectly depend from claim 41, are patentably distinguishable over the cited combination of references.

Still further, as noted above, the rejection of amended claim 59 is unsupported by the art. Therefore, amended claim 59 negates a prima facie showing of obviousness with respect to the cited combination of references. Accordingly, claims 61-67, 69 and 70, which directly or indirectly depend from amended claim 59, are patentably distinguishable over the cited combination of references.

Claim 46

Claim 46 is rejected under 35 U.S.C. §103(a) as being unpatentable over Skoyles. The Applicants respectfully submit that the rejection of claim 46 is unsupported by the art and should be withdrawn.

As noted above, the rejection of claim 41 is unsupported by the art. Therefore, claim 41 negates a prima facie showing of obviousness with respect to the cited reference. Accordingly, claim 46, which directly depends from claim 41, is patentably distinguishable over the cited reference.

Conclusion

In conclusion, the Applicants respectfully assert that claims 1-43, 46-67 and 69-74 are patentable for the reasons set forth above, and that the application is now in a condition for allowance. Accordingly, an early notice of allowance is respectfully requested. The Examiner is requested to call the undersigned at 858-456-1951 for any reason that would advance the instant application to issue.

Dated this the 16th day of November, 2007.

Respectfully submitted,

STEVEN G. ROEDER
Attorney for Applicants
Registration No. 37,227

THE LAW OFFICE OF STEVEN G. ROEDER
5560 Chelsea Avenue
La Jolla, California 92037
Telephone: (858) 456-1951